



Phase III

Lake Decatur Watershed Management Plan

- DRAFT -

SCOPE OF SERVICES & BUDGET

Northwater Consulting

September 7, 2021

Exhibit A.1

PHASE III – Watershed Initiative Development

Phase III Period: October 1, 2021 through September 2022 (12-months)

Task Summary	Description
Task 3.1. Nine Element ¹ Watershed Plan Friends Creek Update <small>¹Nine minimum elements for planning are defined by the Environmental Protection Agency that make the plan eligible for grant funds</small>	<ul style="list-style-type: none"> • Complete watershed plan update to include implementation component and modeling only. • If determined feasible, apply for section 319 implementation grant for Bluffs, Wildcat, or Sand Creek subwatershed.
Task 3.2. Nine Element ¹ Watershed Plans Wildcat Creek, Willow Branch, and Sand Creek	<ul style="list-style-type: none"> • Complete 9-element subwatershed plan(s). One plan will be completed for Sand Creek and one for both Wildcat Creek and Willow Branch.
Task 3.3. Grant Applications & Management (RCPP and Illinois EPA)	<ul style="list-style-type: none"> • Complete the process of coordinating with partners and submitting RCPP grant application. • Should the RCPP grant be awarded, lead the negotiations and further development of the scope of work. • Finalize the grant agreement and notice to proceed. • Assist City staff with Section 319 grant management and reporting.
Task 3.4. Watershed Coordination & Plan Implementation	<ul style="list-style-type: none"> • Provide guidance to Macon County SWCD and forward modified cost-share program. • Conduct one-on-one landowner outreach and engagement. • Advance BMPs on City-owned land as identified in Bluffs plan.
Task 3.5. Special Project Advancement	<ul style="list-style-type: none"> • Phase I and II identified special projects and initiatives that warrant special attention and advancement due to the potentially significant water quality benefits and RCPP leveraging opportunities. • Further advance: specialty crops and development of Oakley sediment dewatering basin, conservation

Task Summary	Description
	practices on City-owned farmland, carbon and water quality trading pilot, and anchored, floating wetlands.
Task 3.6. BMP Engineering & Design	<ul style="list-style-type: none"> • Survey, design and engineering of practices described in the 2020 Section 319 application – forested gully stabilization and stair-step wetlands. • Other engineering services on an as-needed basis.
Task 3.7. Watershed Monitoring Program	<ul style="list-style-type: none"> • Continue coordination with the Illinois State Water Survey (ISWS) regarding monitoring at three stations (Sangamon at Cisco bridge, Long Creek, Friends Creek). • Commence automatic monitoring station at Cisco Bridge in partnership with NGRREC. Support NGRREC as needed. • Storm-event sampling at three stations and continued baseline monitoring of proposed BMP sites. • Design and implement a database system for monitoring datasets
Task 3.8. Lake Sedimentation & Bathymetry Program	<ul style="list-style-type: none"> • Lake-wide bathymetric survey using acoustic Doppler technology. Serves as post-dredge baseline to monitor sediment accumulation moving forward. • Produce Lake Decatur bathymetry map for City and public use.
Task 3.9. Policy Ordinance Planning & Support	<ul style="list-style-type: none"> • Continued support in assessment, planning and management of the dewatering basin. • Assessment of city-controlled properties and development of a plan to capitalize on opportunities to improve water quality. • Support the City in developing guidelines and by-laws for lakeshore property transactions.
Task 3.10. General Consulting	<ul style="list-style-type: none"> • Budget for general consulting for out of scope services or support that may be requested.



Figure 1 - Nine Minimum Elements Required by Illinois EPA

1. Data mining.
2. Complete field work and develop custom map layers.
3. Quantify causes and sources of pollution.
4. Pollution load modeling and analysis.
5. Update nutrient and sediment reduction targets.
6. Identify and map field/property specific management practices.
7. Load reduction calculations.
8. Identification of critical areas & hot spots – prioritize based on nutrient and sediment reductions achieved.
9. Update cost estimates.
10. Landowner/public outreach and meetings.
11. General coordination.

Task 3.2: Nine Element Watershed Plan – Wildcat Creek/Willow Branch & Sand Creek

Two nine-element watershed plans will be initiated during phase III and completed in phase IV based on the subwatershed plan sequencing defined in the LTS. Approximately 50% of these plans will be completed in phase III. A portion of the funding for this effort will be received through the Illinois EPA Section 319 program.

- o Sand Creek
- o Wildcat Creek – Sangamon River and Willow Branch.

Task 3.1: Nine Element Watershed Plan – Friends Creek Update

Watershed plan enhancements will be completed for Friends Creek as outlined in the Long-Term Strategy (LTS). The current plan is lacking specific project locations, accurate nutrient and sediment loading estimates and project-based load reductions. Northwater will update current plan with an actionable implementation component and build a pollutant load model to accurately quantify loading. A portion of the funding for this effort will be received through the Illinois EPA Section 319 program. The following activities will be performed to update the plan.

This task will include the following activities:

1. Data mining.
2. Complete field work and develop custom map layers.
3. Complete watershed characterization and inventory.
4. Identify causes and sources of pollution.
5. Pollution load modeling and analysis.
6. Establish nutrient and sediment reduction targets.
7. Field/property specific management practices.
8. Load reduction calculations.
9. Identification of critical areas & hot spots – prioritize based on nutrient and sediment reductions achieved.
10. Landowner/public outreach and meetings.
11. Education and outreach component consistent with RCPP strategy.
12. Cost estimates and milestones.
13. General coordination.

Task 3.3: Grant Applications & Management (319 & RCPP)

Northwater anticipates an enhanced RCPP application and program totaling approximately **\$25M** dollars of combined federal dollars and partner contributions. There is a 50-50 match requirement, so approximately \$15M of partner and City contributions will allow for \$10M of federal funding. This task will include grant management and oversight of the RCPP and awarded Section 319 funds and submittal of additional applications under Phase III if necessary.

USDA-RCPP

An application was submitted in 2020 and was not awarded. Considering feedback from agency reviewers, Northwater will restructure the previous application re-submit in 2021. The USDA is believed to begin accepting applications in mid-September 2021 with a due date of mid to late November. A Phase III budget allocation will be used to finalize and submit the application in late 2021. If awarded, negotiations with the USDA will be required in June/July 2021 and also fall under Phase III.

Activities will include:

1. Finalize RCPP application and re-submit on behalf of the City.
2. Partner coordination.
3. Develop partner and contribution tracking methods and procedures.
4. Secure final partner contribution commitments upon RCPP award notification.
5. Negotiate final RCPP agreement in coordination with the City.

Illinois EPA Section 319

The application submitted in 2020 is anticipated to begin in the fall of 2021. If awarded, this 2-year grant will cover subwatershed planning as described in Section 3.1 and 3.2, and on-the-ground implementation. Northwater will assist City staff in conducting grant management. This will include:

1. Quarterly reporting and BMP forms.
2. Partner coordination and project management to ensure deadlines are met.
3. Final reports.

Northwater will prepare and submit on behalf of the City, a Section 319 grant application in August of 2022 if deemed appropriate. Parameters of this application will be developed based on outcomes of Task 3.4.

Task 3.4: Watershed Coordination & Plan Implementation

Northwater will work with the Macon County SWCD, City and others to implement the recently completed Bluffs subwatershed plan and enhance/expand the existing City-funded cost-share program. This will include:

1. Provide guidance and training to SWCD staff.
2. Conduct strategic one-on-one landowner outreach to forward the RCPP and other critical practices on private property identified in the plan.
3. Work with partners to advance projects prioritized on City-owned property. This includes wetlands, re-connecting streams to their floodplains, prairie restoration, and urban BMPs.
4. Oversee Macon County SWCD contract and align staff resources with RCPP and other watershed activities.
 - a. Restructure current cost-share program to align with 5-year strategy and RCPP. This will include parameters for BMP maintenance, filter strips and drainage water control structures. A fiscal agent model for distributing funds will be explored.
 - b. Restructure current education and outreach efforts to align with the 5-year strategy and RCPP.

Task 3.5: Special Project Advancement

During Phase II, special projects and initiatives were advanced with a goal to generate significant water quality benefits to the lake and watershed with the ability to leverage other state and federal funds. These projects included:

1. Specialty crops (CoverCress, Inc.), fertilizer field trials, treatment wetland and erosion control at the DeWitt well field.
2. Conservation practices on City-owned farmland.
3. Upper lake and Big/Long Creek floating wetland system.
4. Carbon and water quality trading pilot program.
5. Development of sediment dewatering basin to forward opportunities that generate revenue for watershed improvements and grant “match.”
 - a. Production agriculture and organic crops.
 - b. Conservation and innovation.

- c. Marketing and outreach initiatives (i.e. locally sourced products).

This task includes further advancement of these project opportunities through coordinating with the City, stakeholders, landowners, regulators, and the private sector. Northwater will advance feasibility analyses, develop final costs and initiate the necessary funding proposal(s) for the floating wetlands.

Northwater will continue to work with partners to establish the carbon and water quality trading pilot, complete one year of field trials and monitoring at the well field site, work with the City and farmland manager to incorporate conservation practices into future lease agreements on City-owned property, and forward drainage, multi-use and organic farming projects at the Oakley Sediment Basin.

Task 3.6: BMP Engineering & Design

Engineering and design is required under Phase III to support project implementation under the 2020 Section 319 grant, for special projects described in Task 3.5, and to support any needs that may arise from work performed under Task 3.4. Northwater will complete or sub-contract the necessary survey and design for the following:

1. Forested gully stabilization – 2020 Section 319 grant.
2. Stair-step wetlands on Macon County Conservation District properties – 2020 Section 319 grant.

Additional engineering support is included on an as needed basis and may include:

1. Floating treatment wetlands.

Task 3.7: Watershed Monitoring Program

The monitoring program includes:

1. Database
 - o A relational database system will be designed setup to store and manage all monitoring data. Data will be maintained in a relational MS Access database using the SiteFX data model developed by EarthFX Inc. The system has quality assurance / quality control integration and streamlines data organization, documentation, and validation. A disciplined management procedure will make it cost and time efficient to utilize data for analysis, decision-making, management, and reporting.
 - o Managing and maintaining the database will be an on-going and important part of the monitoring program.

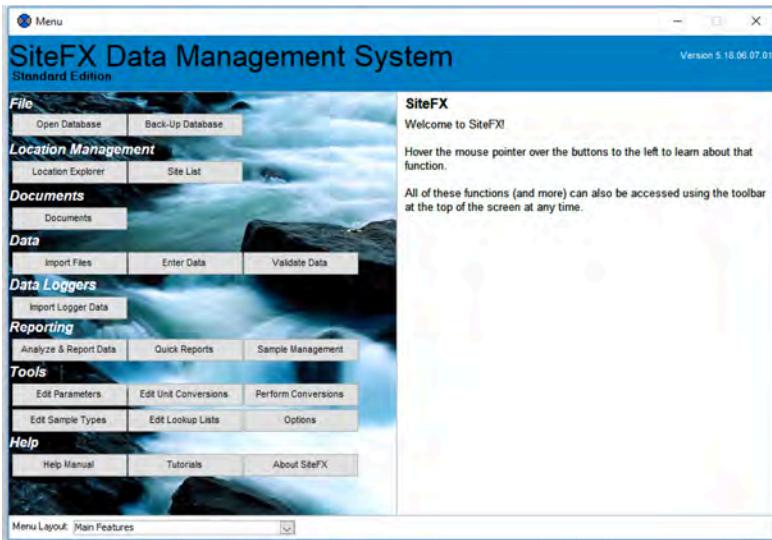


Figure 2 - Screenshot of the SiteFX Data Management System

2. Discrete Monitoring

- Water quality monitoring will continue in partnership with ISWS approximately bi-weekly at the three stations established in late 2019. Locations include, (i) Sangamon River IL 32, (ii) Friends Creek and (iii) Big/Long Creek. Storm-event sampling will target 2-3 storm events during phase III. The City is setup to perform laboratory analysis on the storm-event samples. The ISWS lab analyzes the bi-weekly samples.

3. Continuous Monitoring

- Phase III will include the final commissioning and commencement of the automatic monitoring station on the Sangamon River at the IL 32 bridge. This is planned in partnership with National Great Rivers Research and Education Center (NGRREC) and includes river flow/stage, nitrate, turbidity, temperature/conductivity, dissolved oxygen and dissolved organic matter. The monitoring sensors, telemetry and solar power system was purchased under phase II and installation is planned in October 2021.
- BMP Monitoring sites
 - DeWitt Well Field – Baseline monitoring to characterize stormwater and drainage tile flows and sediment and nutrient concentrations.
 - Bluffs Ravine (BMP102) – Baseline monitoring of bank erosion will continue, as well as collection of stormwater samples for sediment and nutrient analysis when feasible.
- On behalf of the City, Northwater will coordinate with NGRREC in the maintenance and operation of the system to minimize downtime. Data will be regularly checked with QA/QC procedures to make sure the station and sensors are in working order and data quality is satisfactory.

Task 3.8: Lake Sedimentation and Bathymetry Program

Considering the recent \$92M investment in dredging, lake bathymetry and sediment accumulation monitoring is important to track the loss of lake storage capacity both spatially and temporally. It also serves as a means to estimate sediment yields and track progress towards reducing loading. It will also be a valuable resource for the City and community to have access to an updated and accurate map of the lake.

The lake bathymetry and sediment accumulation monitoring strategy were developed during Phase II and the monitoring will commence in Phase III. The plan is to perform baseline lake-wide mapping in Phase III and establish between 6 and 11 formal cross-sections for monitoring every 2-3 years in subsequent phases.

Lake-wide Bathymetric Baseline Mapping

Northwater will perform the survey planning, execution, data post-processing, and production map(s) for internal and external use. It is estimated that the field survey will take between 5 and 8 weeks, depending on lake conditions.

Survey will be performed using a motorized boat equipped with a XYLEM SonTek M9 Acoustic Doppler Profiler and GPS receiver. The M9 can profile bathymetry up to 40 m depth with 0.001 m depth resolution. HYPACK hydrological surveying software will be used to plan the survey to optimize results in key areas of interest and cross sections for follow-up monitoring. HYPACK will also be utilized to post-process the data and develop bathymetry profiles. When future monitoring is performed, the software can be utilized to calculate changes in lake storage (sediment accumulation). Lake level transducers will be installed during the entire duration of the survey to record accurate lake levels, this is important to properly correct the survey data for changing lake levels throughout the duration the survey period. High resolution and accurate surveying is necessary to monitor sediment accumulation.

Upon completion of the survey and the data processing, Northwater will produce a professional lake bathymetry map, and establish the baseline conditions to enable efficient continued monitoring of lake bathymetry and sediment accumulation.

Task 3.9: Policy & Ordinance Support

Development, modifications and alterations along the shoreline of Lake Decatur and the contributing waterways impacts water quality, infrastructure, and the efficacy to cost-effectively manage and maintain the lake as a drinking water supply and recreational resource. This task continues from Phase II to support the City as needed related to policy and ordinance initiatives relevant to enhancing and protecting the lake and water resources. Specific tasks and activities are note defined but may include:

- Policy and ordinance reviews.
- Recommendations and proposed language for ordinances, policies etc.
- Strategies and recommendations to integrate the Bluffs watershed plan into policies and ordinances.

Task 3.10: General Consulting

Due to the diverse range of tasks and activities in Phase III, a general consulting task is included to efficiently support the City as needed in case out of scope engineering or environmental consulting is requested.

Exhibit A

A.1 – Phase III Budget

Exhibit A.1

Lake Decatur Watershed Management Phase III: October 2021 - September 2022

	Principal	Sr. Engineer / Scientist	Enginner / Scientist II	Environmental Scientist / GIS Analyst I	Environmental Technician / GIS Analyst	
Hours						
Task 3.1: Nine Element Plan - Friend's Creek Update	220	40	40	280	440	
Task 3.2: Nine Element Plan - Wildcat Creek & Sand Creek	175	25	28	210	290	
Task 3.3: Grant Applications & Management	205	5	5	5	0	
Task 3.4: Watershed Coordination & Plan Implementation	195	0	0	0	0	
Task 3.5: Special Project Advancement	100	25	0	5	0	
Task 3.6: BMP Engineering & Design	35	100	5	0	0	
Task 3.7: Watershed Monitoring Program	110	30	80	40	190	
Task 3.8: Lake Sedimentation & Bathymetry Program	90	155	0	300	300	
Task 3.9: Policy & Ordinance Support	50	18	0	45	0	
Task 3.10: General Consulting	45	24	0	12	0	
Direct Labor						
Task 3.1: Nine Element Plan - Friend's Creek Update	\$12,163.80	\$1,740.00	\$1,488.00	\$7,593.60	\$7,106.00	
Task 3.2: Nine Element Plan - Wildcat Creek & Sand Creek	\$9,675.75	\$1,087.50	\$1,041.60	\$5,695.20	\$4,683.50	
Task 3.3: Grant Applications & Management	\$11,334.45	\$217.50	\$186.00	\$135.60	\$0.00	
Task 3.4: Watershed Coordination & Plan Implementation	\$10,781.55	\$0.00	\$0.00	\$0.00	\$0.00	
Task 3.5: Special Project Advancement	\$5,529.00	\$1,087.50	\$0.00	\$135.60	\$0.00	
Task 3.6: BMP Engineering & Design	\$1,935.15	\$4,350.00	\$186.00	\$0.00	\$0.00	
Task 3.7: Watershed Monitoring Program	\$6,081.90	\$1,305.00	\$2,976.00	\$1,084.80	\$3,068.50	
Task 3.8: Lake Sedimentation & Bathymetry Program	\$4,976.10	\$6,742.50	\$0.00	\$8,136.00	\$4,845.00	
Task 3.9: Policy & Ordinance Support	\$2,764.50	\$783.00	\$0.00	\$1,220.40	\$0.00	
Task 3.10: General Consulting	\$2,488.05	\$1,044.00	\$0.00	\$325.44	\$0.00	
Direct Costs (Subs, mileage, equipment, etc)						
Task 3.1: Nine Element Plan - Friend's Creek Update	\$2,200.00	\$0.00	\$0.00	\$0.00	\$220.00	\$2,420.00
Task 3.2: Nine Element Plan - Wildcat Creek & Sand Creek	\$3,200.00	\$0.00	\$0.00	\$0.00	\$320.00	\$3,520.00
Task 3.3: Grant Applications & Management	\$750.00	\$0.00	\$0.00	\$0.00	\$75.00	\$825.00
Task 3.4: Watershed Coordination & Plan Implementation	\$820.00	\$0.00	\$0.00	\$0.00	\$82.00	\$902.00
Task 3.5: Special Project Advancement	\$820.00	\$0.00	\$0.00	\$0.00	\$82.00	\$902.00
Task 3.6: BMP Engineering & Design	\$2,000.00	\$0.00	\$0.00	\$0.00	\$200.00	\$2,200.00
Task 3.7: Watershed Monitoring Program	\$19,500.00	\$0.00	\$0.00	\$0.00	\$1,950.00	\$21,450.00
Task 3.8: Lake Sedimentation & Bathymetry Program	\$16,500.00	\$5,500.00	\$0.00	\$0.00	\$2,200.00	\$24,200.00
Task 3.9: Policy & Ordinance Support	\$400.00	\$0.00	\$0.00	\$0.00	\$40.00	\$440.00
Task 3.10: General Consulting	\$310.00	\$0.00	\$0.00	\$0.00	\$31.00	\$341.00
Phase III Total						
Task 3.1: Nine Element Plan - Friend's Creek Update	\$30,091.40	\$90,274.20	\$2,420.00	\$92,694.20		
Task 3.2: Nine Element Plan - Wildcat Creek & Sand Creek	\$22,183.55	\$66,550.65	\$3,520.00	\$70,070.65		
Task 3.3: Grant Applications & Management	\$11,873.55	\$35,620.65	\$825.00	\$36,445.65		
Task 3.4: Watershed Coordination & Plan Implementation	\$10,781.55	\$32,344.65	\$902.00	\$33,246.65		
Task 3.5: Special Project Advancement	\$6,752.10	\$20,256.30	\$902.00	\$21,158.30		
Task 3.6: BMP Engineering & Design	\$6,471.15	\$19,413.45	\$2,200.00	\$21,613.45		
Task 3.7: Watershed Monitoring Program	\$14,516.20	\$43,548.60	\$21,450.00	\$64,998.60		
Task 3.8: Lake Sedimentation & Bathymetry Program	\$24,699.60	\$74,098.80	\$24,200.00	\$98,298.80		
Task 3.9: Policy & Ordinance Support	\$4,767.90	\$14,303.70	\$440.00	\$14,743.70		
Task 3.10: General Consulting	\$3,857.49	\$11,572.47	\$341.00	\$11,913.47		

Phase III Total	\$465,183.47
Estimated Illinois EPA 319 Grant Contribution	(\$75,000.00)
Estimated Total Phase III City Cost	\$390,183.47